MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

THIRD YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN EDUCATION

KRM 300: SOIL FERTILITY AND PLANT NUTRITION

Date: SCHOOLBASED **Time: 2hrs**

INSTRUCTIONS:

Answer ALL questions in section A and ANY TWO questions in section B

SECTION A: (COMPULSORY) (30 MARKS)

QUESTION ONE (30 MARKS)

a) Explain the following terms
   i) Soil fertility (2 marks)
   ii) Mineralization (2 marks)
   iii) Immobilization (2 marks)
   iv) Isomorphous substitution (2 marks)

b) Explain three criteria to be met for an element to be considered essential. (6 marks)

c) Explain three different organic layers in soil. (6 marks)

d) A Laboratory test showed that soils of Machakos University farm had low values of Exchangeable potassium. Explain four possible ways which could have contributed to potassium (K^+) loss from the soil. (4 marks)

e) Explain three forms in which nutrients occur in soil. (6 marks)

SECTION B: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION TWO (20 MARKS)

a) Explain five functions of Nitrogen in plants (10 marks)

b) A soil sample analysis showed low values of calcium. Explain five deficiency symptoms which can be observed in plants due to this condition. (10 marks)

QUESTION THREE (20 MARKS)

a) Explain five methods used in classification of fertilizers. (10 marks)

b) Soil samples were collected from KARLO - Katumani and found to be of low quantity of soil organic matter. Explain five factors which could lead to this (10 marks)

QUESTION FOUR (20 MARKS)

a) With the aid of a diagram explain the Potassium cycle. (10 marks)

b) Explain five factors that affect nutrient uptake by plants. (10 marks)

QUESTION FIVE (20 MARKS)

a) Plant growth and yields vary with different soil types. Explain five soil factors affecting plant growth. (10 marks)

b) Explain any five soil physical properties. (10 marks)